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(54) Disc brake.

(57) A disc brake comprises a rotor 12, inner and outer brake pads 14,16, and a caliper housing 124 to which the brake pads are connected. A body member 122 of the caliper housing 124 comprises a cylindrical recess housing a piston 18 to which the inner brake pad 14 is connected. A bridge 126 of the caliper housing 124 connects the body member 122 to an arm member 128, to which the outer brake pad is attached, and comprises first and second bridge portions 130, 132. The second bridge portion 130 is located downstream of the first bridge portion 132, relative to the normal direction of rotation of the rotor 12, and lies at an angle A to the normal to the plane of the rotor, being disposed such that its body member end 140 is upstream of its arm member end 142. The first bridge portion 130 may also lie at an angle to the normal to the plane of the rotor 12. The arrangement reduces asymmetrical wear of the brake pads 14,16; and thereby brake noise and wear.

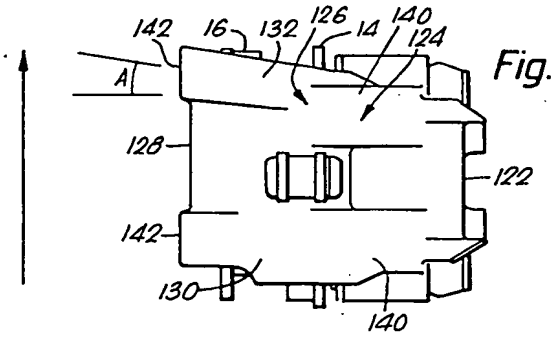

Fig.3.

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The brake is actuated by causing the piston to move, hydraulically, out of the body portion 22, thereby urging the inner brake pad 14 against the rotor 12. By reactive force, the caliper housing 24 is made to float such that the outer brake pad 16 is urged against the other side of the rotor 12.

A first embodiment of disc brake is shown in Figure 3, in which all the components of the brake are substantially as described above, apart from the caliper housing which has a modified form. The caliper housing 124 comprises a body member 122 having a cylindrical recess (not shown) for housing the piston 18, and arm member 128, and first and second substantially rigid bridge portions 130, 132 respectively. Each of the bridge portions is connected to the body member 122 at a first longitudinal extent 140, hereinafter referred to as the body member end 140, and to the arm member 128 at a second longitudinal extent 142, hereinafter referred to as the arm member end 142. The first bridge portion 130 lies substantially perpendicularly to the plane of the rotor (not shown) and upstream of the second bridge portion 132 relative to the normal direction of rotation of the rotor 12 (shown by the arrow). The second bridge portion 132 lies at an angle A to the normal to the plane of the rotor 12 and is disposed such that its body member end 140 is upstream relative to its arm member end 142 so that the arm member 128 is laterally offset relative to the body member 122.

The optimum angle A for the second bridge portion 132 varies between different types of caliper housings, and can be found by experiment.

As can be seen in Figure 3, the outer brake pad 16 lies slightly downstream of the inner brake pad 14. This is not essential, as is the case with the other embodiment described below.

Referring to Figure 4, a second embodiment of caliper housing 224 comprises a substantially rigid bridge 226 having a second bridge portion 232 equivalent to the second bridge portion 132 of Figure 3. The first bridge portion 230 lies at a small angle B relative to the normal to the plane of the rotor (not shown) and is disposed such that its body member end 140' is downstream of its arm member end 142', relative to the normal direction of rotation of the rotor (shown by the arrow).

Angle B is less than angle A, and its optimum value can be found by experiment.

A third embodiment of caliper housing can be seen in Figure 5, in which the first and second substantially rigid bridge portions 330, 332 respectively of the caliper housing 324 both lie at an angle A relative to the normal to the plane of the rotor (not shown), such that their respective body member ends 140'' lie upstream of their respective arm member ends 142'' relative to the normal direction of rotation of the rotor (shown by the arrow).

Figure 6 shows an embodiment of disc brake of the fixed type, that is, of the type that is fixed to a support structure of the vehicle to prevent the caliper housing from floating. This disc brake has two pistons associated with each brake pad although, as is more common, there may be only one piston for each brake pad. The pistons 18 may be of different sizes and may be arranged in a non-symmetrical manner, that is, opposing pistons may lie on different axes.

The caliper housing 424 is formed of two substantially identical halves fixed to one another. The body member 422 comprises two generally cylindrical recesses 20 housing two pistons 18 which are connected to the inner brake pad 14. On the other side of the rotor 12 is located a second member 428 of substantially the same form as the body member 422 and comprising two cylindrical recesses 20 housing two pistons 18 which are connected to the outer brake pad 16.

Connecting the body member 422 to the second member 428, is a substantially rigid bridge 426 formed of first and second bridge portions 430,432 respectively, each of which lies at an angle C to the normal to the plane of the rotor 12. Each of the first and second bridge portions 430, 432 is such that its respective body member end 440 is upstream of its respective second member end 442 relative to the normal direction of rotation of the rotor 12 (shown by the arrow). The optimum angle C can be found by experiment.

Other arrangements of first and second bridge portions 430,432 are possible, as will be apparent from the above.

It has been found that by altering the alignment of one or both of the bridge portions of the caliper housing, as with the embodiments described above, asymmetric wear of the brake pads is reduced, thereby reducing brake noise and wear.

Claims

1. A disc brake for a motor vehicle comprising a rotor (12); inner and outer brake pads (14,16) disposed on opposite sides of the rotor and movable into braking engagement therewith; a piston (18) for urging the inner brake pad (14) against the rotor; and a caliper housing (124) comprising a body member (122) having a cylinder positioned on one side of the rotor and containing the piston, a second member (128) positioned on the other side of the rotor and cooperating with the outer brake pad (16), and a substantially rigid bridge (126) extending between the body member and the second member across the plane of the rotor, the bridge comprising first and second bridge por-

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Fig. 1.

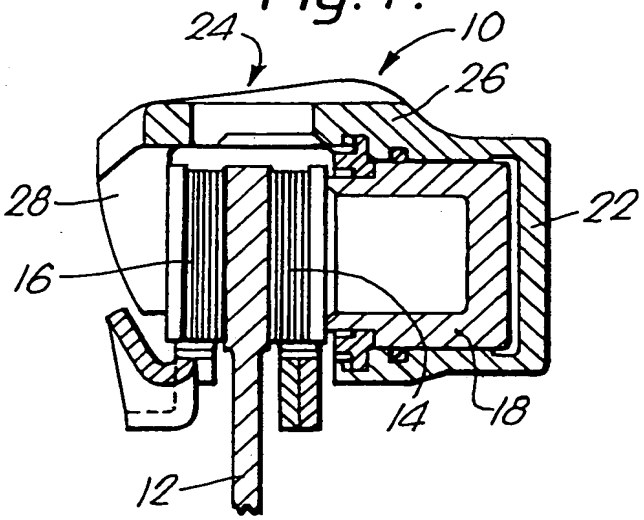

Fig. 2.

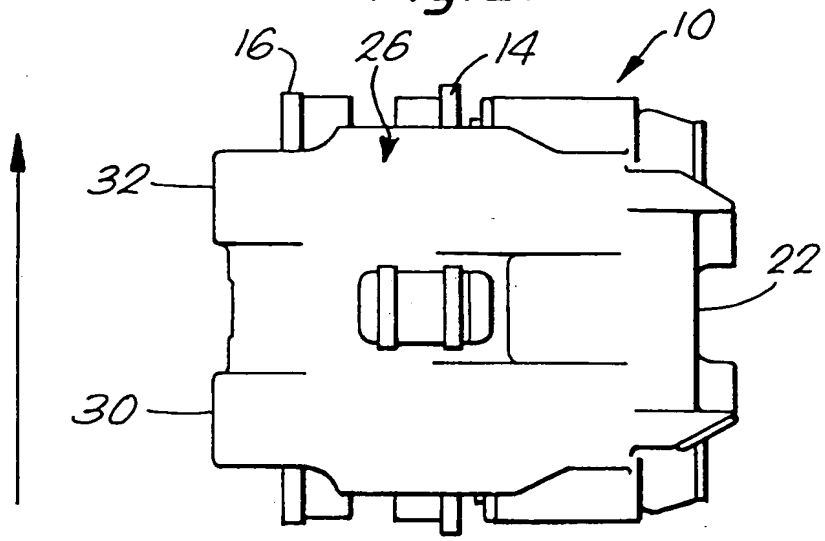

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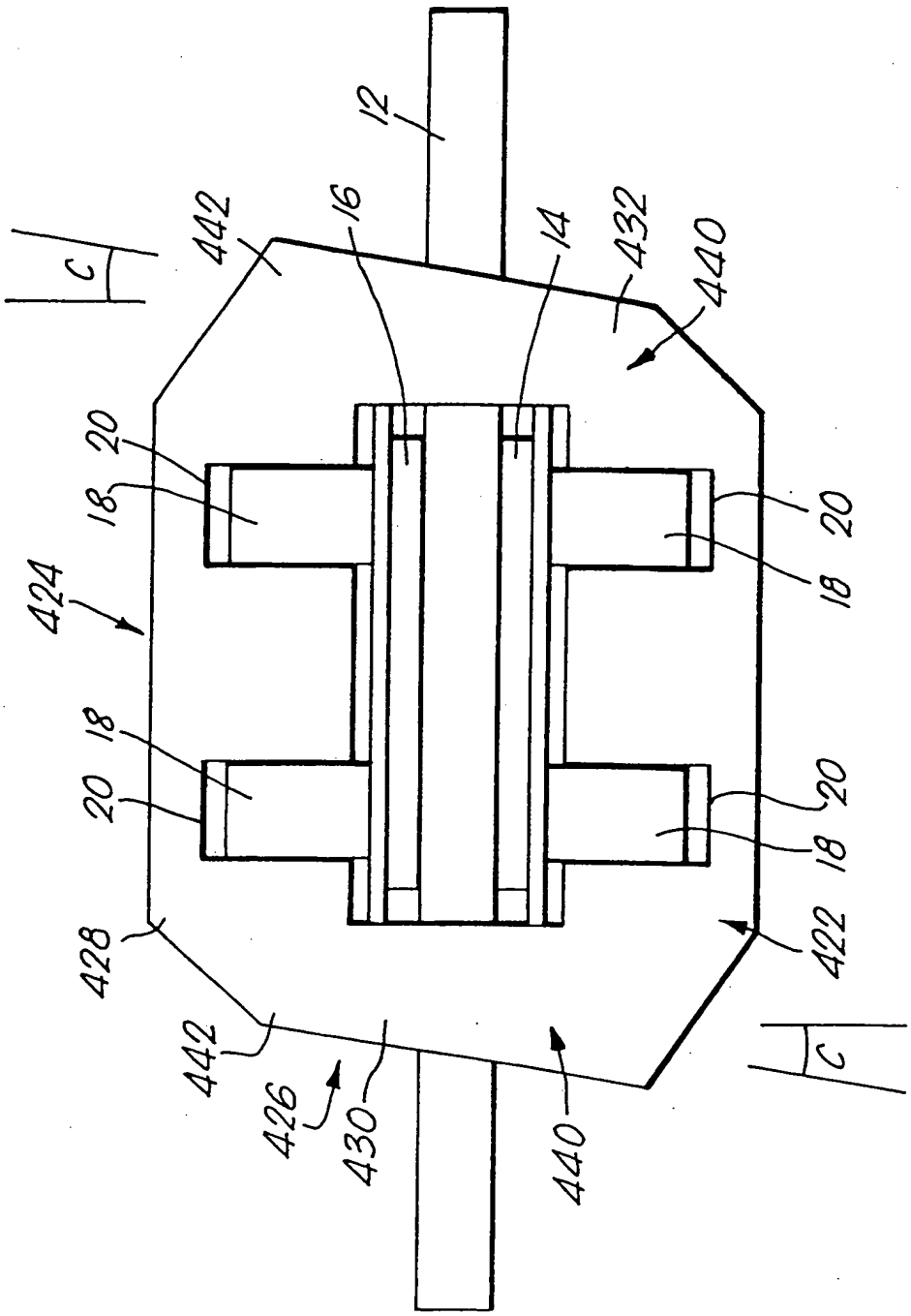
Fig.6.



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